IN THIS ISSUE:

We continue to explore the concept of risk assessment. We are very pleased to have Drs. Heyman and Slep as contributing authors for this issue. They are currently working on a program for the U.S. Air Force to predict the prevalence of family violence. We eagerly anticipate their results. We would like to thank the Air Force FAP for sharing this information with us.

We describe the goals and objectives for establishing Army Centers of Excellence (COE). This is a preview of developments that we expect to occur over the next year.

Our statistics column is dedicated to the preparation and review of proposals and protocols submitted to the Family Advocacy Research Subcommittee (FARS). The FARS will have an important role in the establishment of COE as well as all Army FAP research.

ESTIMATING THE PREVALENCE OF FAMILY MALTREATMENT IN THE ARMED FORCES

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One of the pressing needs of all policy makers charged with reducing the occurrence of family maltreatment is to know how much of it there is in the community. This is a far trickier question than it would appear to be at first blush. This brief article will describe our collaborative efforts with the U.S. Air Force and U.S. Army to provide cost effective answers.

Nationally representative prevalence studies (e.g., Straus & Gelles, 1990; Straus, Hamby, Finkelhor, Moore, & Runyan, 1998) provide examples of estimates of the prevalence of maltreatment in the U.S. civilian population. Would you expect differences between maltreatment prevalence rates for service members and for civilians? Are there differences across branches? Across installations? How can Family Advocacy Program (FAP) staff intervene at different installations if policy planners do not know the extent of the problem? If FAP implements programs to increase public awareness of maltreatment the result may be an increase in case load. Is that a sign that the problem is worsening or that the programs are more effective in reaching more clients? Knowing the prevalence of the problem in the population of interest allows us to provide some answers to these questions.

Our work with the U. S. Air Force (USAF) and U.S. Army has approached an estimation of the prevalence of family maltreatment in two ways: direct measurement (assessment of approximately 100,000 soldiers from 1989-1996) and statistical estimation (developing formulae to estimate prevalences). We will briefly describe some of our work in each area.

Army vs. Civilian Rates

There is ongoing interest, in both scientific and popular circles, in how rates of spousal aggression in the military compare to those of civilians. For example, in May 1994 *Time* (Thompson, 1994) magazine published an article based on unpublished preliminary data from the Army Family Violence Survey (AFVS). These data were derived from needs assessments using the Conflict Tactics Scale (CTS) conducted at 47 TRADOC, FORSCOM, and USARPAC posts from May 1989 – February 1995.

Continued from page 1

The CTS measures behaviors used to resolve marital conflict, such as "discussed an issue calmly" and "pushed, grabbed or shoved." The conclusion published in *Time* was that spouse violence occurs in one out of three Army families each year — double-to-triple the civilian rate. Similar media conclusions — that the Armed Forces have a disproportionately high rate of family violence — have continued to the present,

including a *60 Minutes* segment earlier this year. Such reports typically conclude, explicitly or implicitly, that the military either attracts aggressive men or that military training and culture promotes family aggression. Such comparisons are flawed because they compare military rates to those of the general U.S. population without controlling for the large demographic differences in the populations. Although it received next to no media exposure, the definitive scientific study comparing Army and civilian rates was published earlier this year (Heyman & Neidig, 1999). This study used the AFVS data and national family violence data on civilians (Straus & Gelles, 1990) to determine possible differences in Army and civilian violence prevalence rates. Statistical methods were used to control for differences in population characteristics (age, race, and sex). We adjusted both the Army and civilian samples so that they would look like the 1990 U.S. population on age and race (males and females were analyzed separately to control for differences in sex). The results of this statistical control produced standardized prevalence rates. If the difference in Army and civilian rates were due to age and race alone, the adjusted prevalence rates would be identical. If the Army's rates were due to factors other than age and race, then they would be higher than the civilian rates.

We compared the standardized Army and civilian rates of

moderate and severe husband-to-wife violence. For men's reports, Army rates of moderate husband-to-wife violence were 10.8% (± 0.37%), compared to a civilian rate of 9.9% (± 1.51%). For severe violence, the Army men's reports were 2.5% (± 0.18%) compared to 0.7% (± 0.42%) for the civilians, a statistically significant difference.

Overall, the husband-to-wife violence rates were slightly (i.e., 2-3%) higher in the standardized Army sample than in the comparable civilian sample. The results demonstrate that, although the nonstandardized (i.e., raw) rates of husband-to-wife violence were substantially higher in the U.S. Army than in the civilian population, such differences were mostly due to differences in race and age between the two populations, not to risk for abuse.

There are many limitations to drawing conclusions from these data. Among these limitations are that the data on Army personnel and civilians were not collected in exactly the same way or at the same time. It is very expensive and time consuming to conduct large-scale surveys. Therefore, it would be helpful to have an additional methodology to estimate severe violence prevalence rates.

U.S. Air Force Algorithm Project
An algorithm is a specified set of steps and a formula that solve a problem. The problem in this case

Continued from page 2

was to determine the prevalence of each form of family maltreatment without directly assessing the form of maltreatment. (Note that this is the prevalence of violence, not the prevalence of actual FAP cases in the community.)

The USAF Algorithm Project is a partnership among USAF-FAP, the U.S. Department of Agriculture National Network for Family Resilience, and the State University of New York at Stony Brook. The primary goal of the project is to develop algorithms to estimate the population prevalence of each of the seven forms of child or spouse maltreatment (i.e., spouse emotional, physical and sexual abuse; child emotional, physical, sexual abuse and neglect) in USAF communities. As with all the service branches, the USAF has information on caught cases of maltreatment (i.e., cases reported to Family Advocacy that are cases of abuse or neglect). The goal of this project is to develop algorithms that could estimate the prevalence of all cases of abuse and neglect, caught and uncaught. This approach identifies the most important predictors of each form of maltreatment and weights them so they produce the most accurate estimates. Algorithms that estimate family maltreatment would allow FAP policy makers to:

- Estimate maltreatment prevalences without having to collect data on maltreatment variables regularly

- Make estimates of family violence prevalence at the installation level
- Use these estimates to better tailor prevention and treatment programs to needs of each installation

In completing the Algorithm Project, we adopted three assumptions. First, the phenomenon to be estimated was the occurrence of each of the seven forms of family violence. Second, we aimed to develop formulae that maximize the estimation of the prevalence of family violence rates in a cost-effective manner. Thus, we emphasized already measured and easily measurable variables that are maximally predictive (e.g., age, stress) over variables that could be highly predictive but would be extremely difficult to measure (e.g., personality, psychological disorders). Third, each algorithm would estimate *population* prevalence, *NOT* the likelihood that any *individual* service member has maltreatment occurring in his/her family.

The process of developing our initial algorithms involved seven steps:

1. Identify appropriate archival data sets from which to develop statistical models.
2. Select the maltreatment questions that most closely parallel DoD definitions of maltreatment.
3. Select predictor variables.
4. Divide data sets into random halves: the *development*

subsample and the *crossvalidation* subsample
5. Develop algorithms (statistical models).
6. Test the accuracy of the algorithms through comparing the development sample and the crossvalidation sample.
7. Identify other risk factors from literature review.

The samples used were the AFVS (described earlier), the 1985 National Family Violence Survey (the civilian sample used in the Army-Civilian comparison study), and the 1995 National Survey of Child Maltreatment and Parenting (Straus, Hamby, Finkelhor, Moore, & Runyan, 1998).

Results

Once we developed an algorithm in the development subsample, we tested its accuracy by applying it to an independent sample (the crossvalidation subsample). Results indicated that algorithms developed in the Army subsample could estimate the prevalence of maltreatment in the crossvalidation subsample with remarkable accuracy. For example, the algorithm estimated the prevalence of husband-to-wife severe physical abuse to within 1.28% and wife-to-husband severe physical abuse to within 0.09%. In other words, if one knows the levels of a variety of risk factors (e.g., demographics, stress), one can know the prevalence of maltreatment without directly assessing it. This held true for all forms of family maltreatment

Continued from page 3

(spouse physical, emotional, and sexual abuse; child physical, emotional, and sexual abuse and neglect). The Army Family Violence Survey algorithms even crossvalidated well to a sample of 1,172 USAF personnel who completed the AFVS questionnaire at three USAF installations.

Benefits of the Algorithm Approach

In principle, algorithms provide a highly cost-effective and accurate means of estimating prevalences of the seven forms of family maltreatment. Once an algorithm is crossvalidated, it can be used over and over again without the need to collect new maltreatment data. This represents a significant cost savings when compared to the need to continually collect maltreatment data. Thus, policy makers could update prevalence estimates of partner emotional, physical, sexual abuse and child emotional, physical, sexual abuse and neglect — both for the entire service and for individual installations — with high levels of precision but low levels of cost and time.

The application of algorithms does require the continual collection of fresh data on predictor variables. However, by linking the algorithms to a data source that is re-administered regularly (e.g., regularly administered needs assessments), the expense of applying algorithms is greatly reduced.

Limitations of the Algorithm Approach

Despite the overall successful performance of the algorithms, there are three limitations and considerations that are especially pertinent to the U.S. Army. First, not all the variables used in algorithm development are measured on an ongoing basis. Without the data on predictor variables, the algorithm formulae cannot make estimates. Thus, to apply the algorithms, predictor variables would have to be assessed regularly.

Second, the variables that constituted our maltreatment variables in constructing the algorithms did not always closely parallel the DoD definitions. Ideal algorithms would have *BOTH*

- Maltreatment variables that closely match current DoD definitions.
- Predictor variables that can be feasibly measured on an ongoing basis.

Third, although AFVS algorithms appear to estimate spouse abuse accurately, for maximum confidence, current Army crossvalidation would be necessary because the Army data were collected between 1989 and 1995.

Conclusion

The algorithm approach appears to be a viable means of estimating the prevalence of family maltreatment. The accuracy of the algorithms created thus far indicates that the strategy provides highly accurate estimations of prevalences — providing the

possibility of using algorithm-based prevalence estimates in contexts far beyond "ballpark estimates" for internal use. Although much further work is necessary, it appears that the algorithm approach could be used in the future for purposes such as estimating changes in family maltreatment across time, comparing prevalences across installations, and briefing Congress. However, before algorithms could be used for such extensive and important purposes, additional research is required, such as establishing the margin of error around algorithm estimates and crossvalidating algorithms in recently collected representative samples.

References:
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Ms. Delores Johnson, HQDA, Family Advocacy Program Manager (FAPM) will depart DA on 29 October 1999 to attend the Naval War College in Newport, Rhode Island. During her absence Mr. Rex Becker, who has been the Relocation Program Manager at the Community and Family Support Center, will be the HQDA, FAPM. Mr. Becker's telephone number is (703) 681 – 7393.

FAP CENTERS OF EXCELLENCE (COE) GAINING MOMENTUM

What is a FAP Center of Excellence (COE)? A COE is an installation-level initiative committed to advancing the Army's knowledge in the field of family advocacy. A COE will provide state-of-the-art research, patient care, and educational programs. While COE have been established in the field of health care, we know of none currently existing in the field of family advocacy. The establishment of COE was a recommendation of the January 1997 family advocacy conference held in San Diego, CA. It was proposed that an installation would be designated a COE based on its demonstrated technical performance, resources, client volume, and staff. While there would be no official limit on the number of COE, their establishment would be based on recommendations from the major command (MACOM) and approval from the Department of

the Army. Each COE would be committed to a specialized area of family violence, child or spouse abuse. All would be dedicated to achieving quality FAP services, research, and education.

More specific COE goals are to:

- Acquire new knowledge
- Develop educational/training programs
- Explore innovative approaches to the prevention and treatment of child and spouse abuse
- Serve as sites for demonstration projects
- Develop professional staff
- Encourage military/civilian collaboration
- Perform research and evaluation in the context of an outcome management system
- Utilize a multi-disciplinary approach with extensive collaboration with medical and social service agencies

COE would facilitate the achievement of the four Army outcomes for FAP which are: increasing the safety of personnel, promoting family self-sufficiency, enhancing soldier preparedness, and improving community cohesion. Potentially, COE will strengthen families and decrease occurrence of abuse by using superior management, agency collaboration and thorough methods of research, evaluation, and treatment.

HQDA is in the process of establishing eligibility criteria for awarding grants to installations that apply for the COE

designation. Family violence prevention/treatment initiatives and areas of specialization must be closely linked to the four Army outcomes for FAP.

SUBMITTING AND EVALUATING RESEARCH PLANS

Rather than present a specific statistical topic, this edition of Joining Forces will review some issues of research design and discuss them from the point of view of the Family Advocacy Research Subcommittee (FARS).

The FARS has been in existence for about four years. It was organized under the auspices of the Department of the Army (DA) Family Advocacy Committee to review, coordinate, and recommend the approval and dissemination of family violence research. FARS has the responsibility for all research activities related to the Army (FAP) world wide and use of the Army Central Registry. Additionally, the FARS SOP, DA regulations and numerous supplements exist at the major command and installation level to provide regulatory guidance on conducting FAP research. In some cases, the definition of research itself may be at issue. There are instances in which program reviews and other types of clinical and administrative reviews may be exempted from review as "research." Let us assume, for the

sake of this review, that the research we are interested in (1) involves human participants from whom consent must be obtained, and (2) has family violence as its major theme.

The FARS SOP has two sets of guidelines: one for proposals and one for protocols. The proposal format exists so that an investigator can submit a skeleton plan (an idea) to see if the FARS is interested in the focus of the research and wants the investigator to further develop the idea. If an investigator receives encouragement, then the next step is to prepare a protocol. A protocol is a research plan that includes a literature review, a statement of hypotheses, a research design, and statements on what the research is likely to achieve. The literature review tells what is known about a specific problem (say the effects on children of witnessing spouse abuse). Very frequently, but not always, a research hypothesis is examined statistically.

Following the literature review and statement of hypotheses, the investigator tells the reader how the study will proceed. This will include statements on who the subjects are, what sort of data will be collected, how it will be collected (e.g., mailed questionnaires or interviews of patients), and how it will be analyzed. All of these involve extensive preparation. Some studies may also require a preliminary investigation that is conducted in a pilot study which

may or may not be possible depending on the installation's policies. If your analysis includes statistical tests, how many subjects will you need? This can be very tricky, particularly when you begin to break your analysis down by groups such as by males and females, type of intervention, treatment, or prevention program, active duty and civilian status, and other classifications. The numbers of required subjects can add up quickly. In addition to these considerations, the data collection instruments require close examination. Such issues as reliability and validity are the primary measurement concerns, assuming that you can get people to volunteer for your study. If an investigator expects to receive funding for the research, a budget must be submitted so that adequate funds will be available to accomplish the mission. Finally, there must be some idea of what the research will contribute to the FAP.

When reviewed by the FARS, proposals/protocols are evaluated relative to the:
- Scientific and programmatic relevancy and quality
- Compliance with the administrative criteria of the FARS
- Experience of the investigator
- Reasonableness of the budget
- Soundness of the literature review and
- Consideration of human use issues, if necessary

Investigators may be invited to a meeting of the FARS to discuss or clarify their research interest,

methodology, and the relationship of their literature review to their inquiry. The FARS permits revisions of the protocol.

The FARS procedures are detailed in a SOP. The SOP is being revised and will require the field to submit for FARS review all research on child and spouse abuse in the U. S. Army. The FARS will review all FAP studies intended for publication in a scientific journal or book. The FARS will not routinely review recurring installation program evaluation and analyses such as customer satisfaction surveys, internal reviews, quality assurance assessments, management information system analyses, and annual reports. DA personnel requesting to do research must submit a proposal through the MACOM FAPM to the HQDA FAPM and the FARS. All others must submit proposals directly to CFSC-SF.

If you are interested in submitting a research proposal for FARS review you may request a copy of the SOP from the Family Violence and Trauma Project. Our numbers are listed in the box on page 2.